WESTERN BIRDS

formerly
CALIFORNIA
BIRDS

Vol. 4, No. 2, 1973

SHOUT
SHARE
IT

WESTERN BIRDS

Journal of California Field Ornithologists

President: Guy McCaskie

Treasurer: Clifford E. Lyons

Membership Secretary: Claude Hightower

Secretary, Records Committee: Jon Winter

Editor: Alan R. Craig

Editorial Board: Alan Baldridge, William H. Behle, Andrew J. Berger, Lawrence C. Binford, Thomas D. Burleigh, David F. DeSante, Lucian L. Gaddum, Joseph Greenberg, Ned K. Johnson, Virginia F. Johnston, Peter Kessel, Charles S. Logsdon, Clifford E. Lyons, Tim Manolis, Guy McCaskie, Harry B. Nehls, J. V. Remsen, Jr., Thomas L. Rodgers, Stephen M. Russell, Oliver K. Scott, P. David Shaw, Arnold Small, Richard W. Stallcup, David Starling, C. Shaughnessy Taffel, Terence R. Wahl, Roland H. Wauer, Jimmy Webb, Gale A. Monson.

Volume 4, Number 2, 1973

The Eastern Kingbird in California — *Tim Manolis* — 33

Late Autumn Observations of Pelagic Birds Off Southern California — *Ingrid R. Tebb, Jr.* — 45

Arizona Bird Records, 1972 — *Steven Speich and Theodore A. Parker III* — 53

BULLETIN BOARD — 58

NOTES:

Western Range Extensions of Scaled Quail, Montezuma Quail and Coppery-tailed Trogon in Arizona — *David F. Brown* — 59

Clark's Nutcracker Caught on Cholla Cactus — *Robert R. Dranscoille* — 61

BULLETIN BOARD — 62

Layout and cover design by Virginia F. Johnston.

WESTERN BIRDS

Volume 5, Number 2, 1974

THE DISTRIBUTION OF THE FLAMMULATED OWL IN CALIFORNIA

JON WINTER, Point Reyes Bird Observatory, Box 321, Bolinas, California 94924

Although the Flammulated Owl (*Otus flammeolus*) is a wide-spread temperate and neo-tropical species, its basic biology is obscurely known. The literature on this species is scattered and somewhat fragmented. Little is available on the distribution and relative abundance of this owl throughout most of its range. Current knowledge of this owl is largely due to the work reported by Jacot (1931), Johnson (1962), Marshall (1939, 1957, 1967), A. Miller (1947), L. Miller (1936), Phillips (1942), Phillips, Marshall and Monson (1964) and Ross (1969).

The smallest member of the genus *Otus*, the Flammulated Owl breeds in the mountains west of the Great Plains from southern British Columbia (Godfrey 1966) to Vera Cruz, Mexico (Sutton and Burleigh 1940). Its winter range remains rather vague but it is known to occur from Sierra Autlan, Jalisco, Mexico to Guatemala (Phillips et al. 1964). Since Grinnell and Miller (1944) briefly summarized the distribution of this owl in California a significant amount of new distributional information has accumulated. This paper clarifies the current distributional status of the Flammulated Owl in California.

METHODS AND MATERIALS

In an effort to locate all extant specimens of this species from California, I searched 45 collections throughout North America including one in Mexico (Appendix A). In addition, I surveyed a select group of 44 observers whose field abilities were known to me personally to obtain sight records that would fill in gaps in distribution not substantiated

by specimen material (Appendix B). The remaining records were obtained from the literature. I used 148 records (59 specimen and 89 sight records) in the study. For the purposes of this analysis, a single specimen constitutes a single record. A sight (or heard) record on a single date in a given area is considered a single record regardless of the number of individual birds involved.

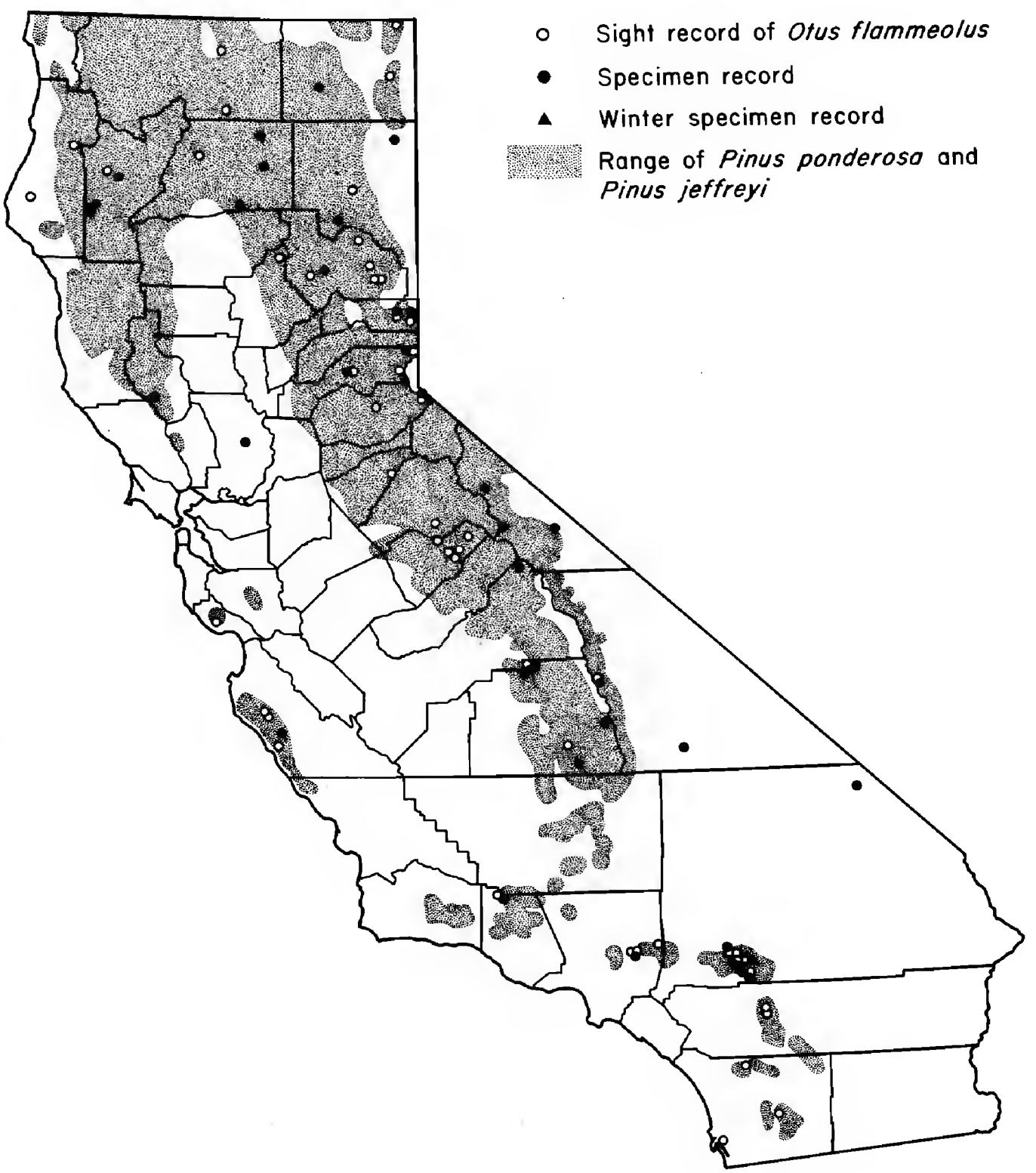

Figure 1. The distribution of the Flammulated Owl (*Otus flammeolus*) in California. The stippled areas show the distribution of yellow pine.

Seasons are defined as follows: winter—1 December to 15 March, spring—16 March to 31 May, summer—1 June to 31 August, fall—1 September to 30 November. In mapping the current distributional range, sight and specimen records were treated separately (Figure 1). In the seasonal distribution (Figure 2) both types of records were utilized to give a fuller understanding of the owl's status.

RESULTS AND DISCUSSION

HABITAT

As a breeding species the Flammulated Owl is mainly limited to the higher parts of the Transition Zone yellow pine belt throughout its range in California. Principal forest dominants of this habitat in the Sierra Nevada include Ponderosa Pine (*Pinus ponderosa*), Sugar Pine (*Pinus lambertiana*), Douglas Fir (*Pseudotsuga menziesii*), White Fir (*Abies concolor*), Incense Cedar (*Libocedrus decurrens*) and Black Oak (*Quercus kelloggii*). Throughout California the owl's breeding range is closely associated with the presence of yellow pine (*P. ponderosa* and *P. jeffreyi*) (Figure 1). The yellow pine belt, especially well developed in the

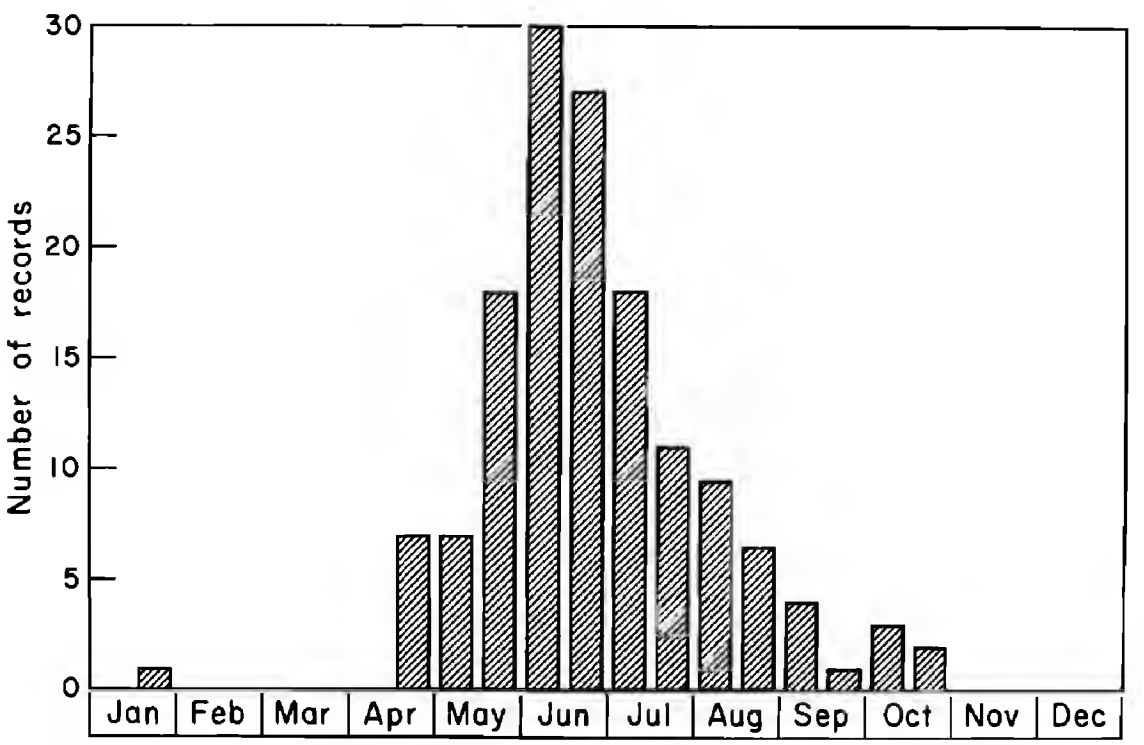

Figure 2. The seasonal occurrence of the Flammulated Owl in California. Both sight and specimen records have been utilized.

Sierra Nevada, is characterized by warm dry summers (average maximum temperature 80°-93° F), with an annual precipitation of 25-80 inches. It ranges vertically from 1200 feet to 5500 feet in the north, 2000 feet to 6500 feet in the central portions and from 2500 feet to 9000 feet in the southern end of the range (Storer and Usinger 1963). Since this habitat contains several species of timber highly desirable for lumber, little of the yellow pine belt remains undisturbed by lumbering activity. Whether this disturbance affects numbers, reproductive success or habitat selection of this species is unknown. However, the bird appears to be very common in second-growth yellow pine habitats I have visited.

This species appears to be less common above the yellow pine belt. Specimens have been taken up to 9500 feet in the Lodgepole Pine-Red Fir belt of the southern Sierra Nevada (Kenyon 1947) where limited breeding takes place. The principle forest dominants of this habitat are Lodgepole Pine (*Pinus murrayana*), Western White Pine (*Pinus monitcola*), Red Fir (*Abies magnifica*) and Jeffrey Pine. The specimen found by Kenyon had died as a result of having a large grasshopper lodged in its throat. This may reflect occasional sub-optimum foraging conditions in the upper parts of the Lodgepole Pine-Red Fir belt. I could find only one instance in which breeding had probably taken place outside the yellow pine belt. A dead juvenile found in the Piñon Pine (*Pinus monophylla*) belt (Upper Sonoran Zone—Miller 1951) of the Argus Mountains, Inyo County (Huey 1932), remains the only record of breeding recorded outside of the yellow pine belt. Although the nest was not actually found it is unlikely the bird was long out of the nest. I have examined the specimen (SDNHM 14919; see Appendix A) and it has about 80-85% of the underparts in barred plumage typical of juvenile *Otus* owls at an age when they are probably still dependent on their parents for food. To my knowledge there is no yellow pine habitat in the Argus Mountains; therefore it is probable the bird fledged from a nest in the Upper Sonoran Piñon Pine belt.

Miller (1951) has indicated that Screech Owls (*Otus asio*) reach the upper limit of their vertical breeding range in the yellow pine belt. I have found Flammulated and Screech Owls together in the yellow pine belt of the central Sierra Nevada and in the Santa Lucia Mountains of Monterey County. However, in all instances the Screech Owl was the rarer of the two congeners.

MIGRATION AND SEASONAL STATUS

Flammulated Owls are migratory in California. The earliest spring record is 19 April at China Camp, Santa Lucia Mountains, Monterey County (Appendix B). The latest fall record is 31 October at Davis,

Yolo County (Emlen 1936). Bailey and Niedrach (1965) reported Flammulated Owls in Colorado as early as 16 April, and Phillips et al. (1964) noted records as early as 26 March in southeastern Arizona. These records suggest that Flammulated Owls may arrive in the southern portions of the state as early as the second week in April, but have escaped detection because calling may not be very frequent at that time of year. The known breeding distribution of Flammulated Owls is just beginning to show definite patterns, but migration patterns are virtually unknown in the state. The October specimen from Davis is the only migrant recorded from the Sacramento Valley.

A specimen from Fresno (AMNH 753957) taken by G. F. Breninger in 1899 is not included in this analysis because Phillips (1942) has cast doubt on the collecting locality of the specimen. The specimen agrees well with a series from the Huachuca Mountains of Arizona to which Phillips compared it. Since Breninger is known to have collected in the Huachuca Mountains, and because the original label is missing, the specimen is best regarded as hypothetical.

The only other migrant was found aboard a naval vessel in San Diego Bay on 10 October 1962 (Banks 1964). This record is the only actual coastal occurrence for the owl in California.

Since Flammulated Owls are strictly nocturnal, their presence is normally revealed by their calls. The seasonal summary of records in Figure 2 indicates the birds are fairly quiet from mid-April to mid-May. Calling sharply increases in the latter half of May and peaks in June. The absence of records in the latter half of September probably indicates a period of quiet during fall molt. A captive juvenile from the central Sierra Nevada whose molt I recorded (photoperiod unaltered) was in very heavy body molt in mid-September. Marshall (Phillips et al. 1964) noted that in the fall after molting there is a resumption of calling. This is indicated by at least five October records.

A winter record of a specimen taken from the San Bernardino Mountains on 18 January 1885 (Stephens 1902) remains unique. The label has been checked three times, twice by Phillips (1942) and again in the current study. No error was made in transcribing the label data. In addition to this record, there are only two substantiated winter records for North America (Simpson and Werner 1958; Glasgow, Gresham and Hall 1950). If Flammulated Owls winter in California they must be extremely rare. Since nearly all resident North American owls will call sometime during the winter, it is especially significant that no Flammulated Owls have been heard in California at that time of year.

For a small insectivorous owl to survive the rigors of winter at temperate zone latitudes, Johnson (1963) has suggested partial vertical migration and torpor as alternatives to normal trans-latitude migration to neo-tropical climates. He asserts (p. 176) that "the ability to become

torpid could serve as a mechanism by which this species might avoid environmental conditions unfavorable for foraging". While this intriguing hypothesis remains to be proved, there is evidence that strongly suggests trans-latitude migration is normal for this species throughout its temperate zone range.

The earliest spring record of a Flammulated Owl north of Mexico appears to be the 26 March sighting in Arizona (Phillips et al. 1964). The bird reported by Emlen (1936) at Davis, California on 31 October is the latest satisfactory fall record. However, Brooks (1909) reported a November specimen from Penticton, British Columbia that had probably died two weeks before. Johnson (1963:175) states that late fall records are significant "because it requires that this...species migrate thousands of miles to and from an unknown wintering quarters in a rather limited amount of time", and that they consitute "an unusually late seasonal occurrence...for a summer resident species". I maintain that this seasonal pattern is normal and not at all unseasonal. Such patterns are known to occur in a number of other species of birds to even greater extremes. McCaskie (1971a) pointed out that the Rusty Blackbird (*Euphagus carolinus*), a smaller bird than the Flammulated Owl, breeds at high latitudes in western Alaska and often remains on its breeding grounds until October. It is not common on its wintering grounds in the southeastern United States until November and departs in spring by the first week of April to return to its breeding grounds. The relative airline distances traveled by both the Rusty Blackbird and the Flammulated Owl from the northern extremes of their breeding to wintering grounds is nearly the same. As for the specimen picked up by Brooks (1909) it should be stressed that the bird was dead when found, which could attest to the inhospitable climate at those latitudes in late fall. An alternative possibility is that this bird came from a more southerly population, was 180° out of phase with its normal fall migration route and went north instead of south. The phenomenon of reverse migration is well documented and occurs regularly, for example, in the Tropical Kingbird (*Tyrannus melancholicus*) along the coast of California in fall (McCaskie 1970).

The two vagrant records of Flammulated Owls reported by Glasgow et al. (1950) and Woolfenden (1970), from Louisiana and Alabama respectively, are particularly noteworthy. If this owl is non-migratory it is indeed remarkable that it could "wander" some 800 to 1000 miles outside its known range. In all instances known to me vagrancy in birds is a very strong indication of highly developed migratory behavior. Furthermore, De Benedictis (1971) has shown that in Vireonidae and Parulidae, long-distance migrants may be subject to greater navigational error than short-distance migrants. If Flammulated Owls are long-distance migrants, occurrences in the southeastern United States would be much more understandable.

Marshall has indicated (Phillips et al. 1964) that there is little geographic variation in the Flammulated Owl in comparison with a highly variable non-migratory congener such as the Screech Owl. Geographic differences among Flammulated Owls appear so weak and exceptional that Grinnell and Miller (1944) and Marshall (1967) do not recognize any subspecies for the bird. Since it is well known that sedentary species of birds usually show a great deal of geographic variation, the absence of such variation would indicate that gene mixing of various populations is common. This lack of variation is probably brought about by the exchange of individuals from one population to another through migratory mixing.

As an alternative to migration, Flammulated Owls might survive periods of food stress through an ability to undergo torpor (Johnson 1963). Experimental evidence substantiating this ability is still lacking. Banks (1964) subjected a captive Flammulated Owl to cold stress conditions by placing it in a refrigerator at 40°F after food had been withheld for 48 hours. The bird failed to show any sign of torpor after 48 hours of refrigeration. It appears that torpor in the Poor-will (*Phalaenoptilus nuttallii*) and the Lesser Nighthawk (*Chordeiles acutipennis*), close relatives of Strigiformes, is essentially a food stress-induced phenomenon (Marshall 1955). Ligon (1968), during a spring freeze in the Chiricahua Mountains of southeastern Arizona in mid-May 1967, found starvation to be common among three species of insectivorous migrants. During this freeze Ligon found an exhausted and emaciated female Flammulated Owl that weighed 39.8 g. Of 12 spring and summer specimens of female Flammulated Owls ranging from Trinity County, California to Coahuila, Mexico, for which I have data, the mean weight was 58.5 g (range 51.5 g - 63.6 g, SD± 3.94 g), indicating that Ligon's bird was in a severely starved condition. Ligon did not report any species known to be capable of torpor as being affected by the spring freeze. Since Flammulated Owls are known to feed extensively on flying insects (Marshall 1957), freezing conditions such as those reported by Ligon would surely limit food availability. Even by the standards outlined by Pearson (1960:93) in which some species might undergo torpor only under the "influence of excessive cold or of hunger", the conditions under which Ligon found this owl should be more than drastic enough to induce torpor if indeed the owls are capable of such behavior. When Ligon found the bird it was still capable of weak flight, showed no sign of a torpid condition, and in spite of attempts to save the bird it died the following day. Furthermore, Ligon (pers. comm. 1972) recently attempted to induce torpor in two captive Flammulated Owls under controlled conditions (which resulted in the death of both birds) and found "no evidence that Flammulated Owls can enter torpor". In view of this, Johnson's (1963) ideas involving torpor and non-migration in this species are best considered hypothetical.

RELATIVE NUMBERS

Quantitative analysis of numbers of birds in any single habitat or geographic location could not withstand critical statistical examination because the data are too fragmented. Although this owl was for many years considered rare (L. Miller 1933, Willett 1912, Grinnell 1915), the development of techniques for finding the birds (Marshall 1939) has contributed greatly to the proliferation of records. The bird's unpredictable behavior, irregular calling, its restricted habitat and habit of remaining concealed have all contributed to its supposed rarity (Winter 1971).

In optimum habitat the Flammulated Owl is probably the most common owl in the Sierra Nevada. Marshall (1939) in two localities only five miles apart at Whitaker's Forest and Big Meadow, Tulare County, collected 11 specimens and heard 18 other birds during the summer of 1938. The Whitaker's Forest location, where Marshall found 24 males, is an area of about 2 square miles, indicating an approximate density of 1.9 males/100 acres. On 30 June 1971 I censused an area 10 miles northeast of Foresthill, Placer County, on Big Oak Flat in habitat very similar to the area in which Marshall worked, and found a density of approximately 2.1 males/100 acres. There were at least 10 males calling on the night of 30 June at the Placer County location. Between 22 May and 1 June 1972 in a rather small area 20 miles northeast of Chico, Butte County, Manolis and Webb (pers. comm. 1972) found 14 male Flammulated Owls. The habitat was in the yellow pine belt at an elevation of about 3200 feet. However, in several transects that I have made across what appeared to be optimum habitat in the late spring, I have often failed to find the owl present. The rather high densities mentioned above might suggest that this species may be "loosely" colonial, congregating in small, rather dense, discrete populations for the purposes of breeding. The Flammulated Owl appears to be a common (to very common in the yellow pine belt of the Sierra Nevada) breeding resident throughout the state wherever suitable habitat exists, from mid-April to October.

CURRENT DISTRIBUTION

The first specimen of this species for California, as well as for North America, was taken at Fort Crook near Cayton, Shasta County on 23 August 1860 (Cooper 1870). Since this specimen, 58 more have been collected in California mainly through the efforts of Joe T. Marshall Jr., Alden Miller, Ned K. Johnson and Ward Russell.

The faunal districts outlined by Miller (1951) for breeding species in California are a convenient breakdown of the general biotic provinces in the state, and will be utilized in this study (Figure 3). It is hoped that use of these faunal districts will lend some ecological understanding to Flammulated Owl distribution.

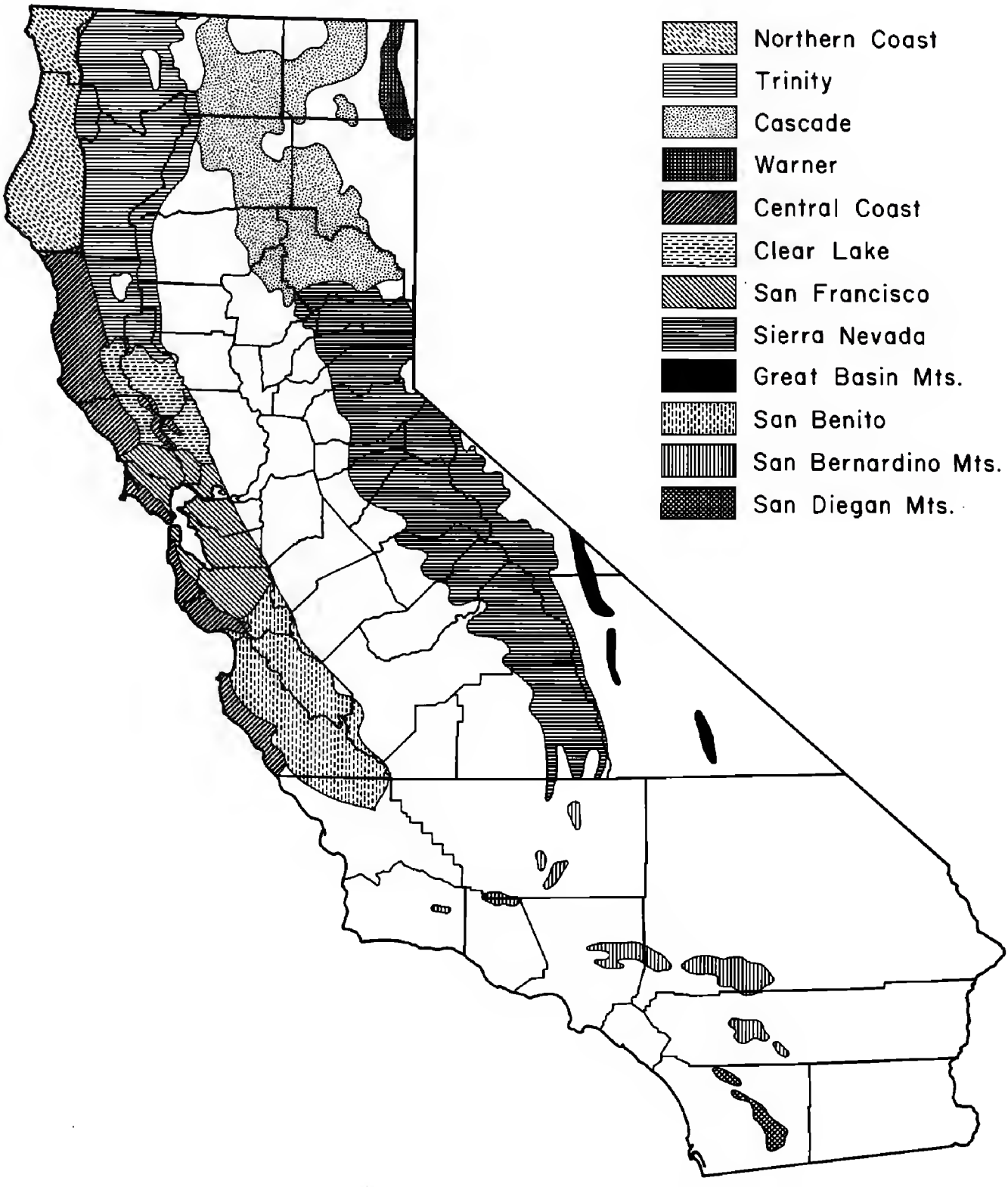

Figure 3. Faunal districts of California redrawn from Miller (1951).

North Coast District

This district includes the coastal fog belt of the Pacific slope from Del Norte County south to southern Humboldt County. The area is characterized by heavy annual rainfall, high atmospheric humidity and lush fern understory. The dominant forest vegetation consists mainly of Grand Fir (*Abies grandis*), Sitka Spruce (*Picea sitchensis*), Redwood (*Sequoia sempervirens*) and Douglas Fir and is atypical habitat for Flammulated Owls. The excessive dampness of this habitat and the lack of yellow pine may be a limiting factor that excludes the owls from this district. There are two records from Humboldt County; one on the Eel River at Alder Point and one at Salmon Mountain on the eastern border of the county. Both locations are within the influence of the Trinity District biotic province.

Central Coast District

This district includes the Pacific slope in northern Mendocino, Sonoma, Marin, San Mateo, Santa Cruz and Monterey counties. The district is similar to the north coast district in high atmospheric humidity from coastal fog and a liberal annual rainfall. With the exception of a local area of Santa Cruz County (which appears to fall more under the influence of San Benito and San Francisco Districts), Flammulated Owls, as well as suitable habitat, are absent throughout the district.

Trinity, Cascade and Clear Lake Districts

Suitable habitat is well developed throughout these districts. There are several sight and specimen records from Trinity County (including the ones mentioned from Humboldt County) in the Trinity District. The reddest specimens that I have seen from California are from Trinity and Modoc counties of the Trinity and Cascade Districts respectively. The grayish morphs are the dominant phenotype in the California specimens while the red morphs are local and exceptional. Examination of a series (n=88) ranging from British Columbia to Guerrero, Mexico in the Museum of Vertebrate Zoology, shows a weak north-south cline of increasing redness to the south. However, some of the exceptions are outstanding. A very red male taken near Canby, Modoc County in June is nearly identical to a very red female labeled *O. f. rarus* (Griscom) taken in August in Guerrero. Such exceptions weaken the validity of *rarus* as described by Griscom (1935).

I was unable to find records from the interior coast ranges of Siskiyou, Mendocino, western Glenn and Tehama counties, but where suitable habitat occurs in these areas the bird should be present. Flammulated Owls are undoubtedly more common in Lake County than the single record reflects. Suitable habitat extends as far south as Mount Saint

Helena in the Clear Lake District in eastern Sonoma County and to Howell Mountain near Angwin in northwestern Napa County. The paucity of records from Siskiyou, Modoc, Shasta and Lassen counties reflects the lack of field work rather than the scarcity of the owl in the Cascade District. In the Warner Mountains Johnson (1970) found several calling males in two different locations in 1964. These are the only records from the Warner Mountains.

San Benito District and the San Francisco District

In the interior portions of Santa Cruz (Ben Lomond) in the Santa Cruz Mountains and in the Santa Lucia Mountains of Monterey County, Flammulated Owls reappear near the coast. The bird appears to be quite common in the latter location. A single record for Santa Cruz County at Ben Lomond is noteworthy because the location is strikingly correlated with the reappearance of Ponderosa Pine in coastal areas south of Napa County. Thomas (1961:62) indicates that Ponderosa Pine is "known locally from the vicinity of Bonny Doon and Ben Lomond". There are several records from the Santa Lucia Mountains at Chews Ridge, Cone Peak and Junipero Serra Peak in a region which harbors large areas of yellow pine habitat.

Sierra Nevada District

Flammulated Owls appear to be most common in this district (Figure 1). The lack of records for eastern Nevada, Amador, Madera and western Alpine counties undoubtedly reflects the lack of field work. The owl is also probably more common in eastern Fresno County than the single record indicates. Yosemite National Park is frequented regularly by field observers and accounts for the several sight records from Mariposa County. A September specimen taken at Hospital Rock (LMC 1892) in Sequoia National Park was apparently overlooked by Sumner and Dixon (1953), who indicated no records of Flammulated Owls within the boundaries of either Kings Canyon or Sequoia National Parks. With more regular field work records of this owl will surely increase in other Sierra Nevada counties.

San Bernardino Mountains District

Flammulated Owls are common in the San Bernardino Mountains (vicinity of Big Bear and Dry Lakes), San Gabriel Mountains, and on Mount Pinos, but oddly enough the bird is recorded only twice from the San Jacinto Mountains and not at all from the Santa Rosa Mountains, where suitable habitat occurs. In the latter area the bird has been overlooked. Habitat is also present in the Tehachapi and Piute systems, but records are lacking.

San Diegan Mountain District

Flammulated Owls have been recently discovered in the Laguna Mountains of San Diego County on Mount Palomar (McCaskie 1971b). Birds have also been heard in the vicinity of Cuyamaca Rancho State Park. Since suitable habitat occurs in the higher parts of the Sierra Juarez of Baja California, Mexico, I suspect that the owl is present there as well.

Great Basin Mountain District

With the exception of a single breeding female taken by Miller (1940) on Clark Mountain in northeastern San Bernardino County and a dead juvenile found in the Argus Mountains (Huey 1932), the owl is unrecorded in the Panamint, Inyo and White Mountains of this district. Clark Mountain harbors a small patch of White Fir some 50 miles southwest of the Charleston Mountains of southern Nevada where the owl is known to breed (Banks and Hansen 1970, Johnson 1965). Colonization of such a remote little pocket of habitat attests to the adaptability of this remarkable little owl if not to its migratory ability. Flammulated Owls have also been recorded in the Sheep Mountains of southern Nevada (Johnson 1965) and in the Hualapai Mountains of northeastern Arizona (Phillips et al. 1964), both of which harbor yellow pine habitat.

SUMMARY

Analysis of 59 specimen and 89 sight records of Flammulated Owl since 1860 reveals the bird to be a common to locally very common breeding summer resident in California from mid-April to October. The bird's supposed rarity is mainly behavioral, and development of techniques for finding this species has greatly increased the number of records. The preferred habitat appears to be Transition to Canadian Zone montane forests where yellow pine (*P. ponderosa* or *P. jeffreyi*) is present. The bird's distribution is analyzed by the faunal districts outlined by Miller (1951). Partial vertical migration and torpor suggested by Johnson (1963) is discussed, and it is concluded that, on the basis of the evidence available, the Flammulated Owl is a trans-latitude migrant that normally winters in Central America from Jalisco, Mexico to Guatemala.

ACKNOWLEDGMENTS

I would like to thank John Smail, Guy McCaskie, Donald Isaac, Gerald Collier and Joe T. Marshall Jr. for their comments on earlier drafts of the manuscript, Ned K. Johnson for providing additional data, and Gary Page for many hours of productive discussion. The coopera-

tion of museum personnel at the museums listed in Appendix A and of the observers listed in Appendix B is greatly appreciated. I would particularly like to thank Nick Story for his advice and preparation of the figures and graph and Tim Manolis for his fine line drawing of *Otus flammeolus*. This is Contribution 84 of Point Reyes Bird Observatory.

LITERATURE CITED

Bailey, A. M. and R. J. Niedrach. 1965. Birds of Colorado. Vol. 1, Denver Mus. of Nat. Hist., Denver.

Banks, R. C. and C. G. Hansen. 1970. Bird records from southern Nevada. Condor 72:109-110.

Banks, R. C. 1964. An experiment on a Flammulated Owl. Condor 66:79.

Brooks, A. 1909. Some notes on the birds of Okanagan, British Columbia. Auk 26:60-63.

Bryant, H. 1920. Edward Garner, pioneer naturalist. Condor 22:32-33.

Cooper, J. G. 1870. Ornithology of California. Vol. 1, Welch, Cambridge.

De Benedictis, P. 1971. Wood warblers and vireos in California: the nature of the accidental. Calif. Birds 2:111-128.

Emlen, J. T. 1936. Flammulated Screech Owl in the Sacramento Valley. Condor 38:43.

Gilman, M. F. 1902. Nesting of the little Flammulated Owl on San Gorgonio mountain. Auk 4:85-86.

Glasgow, L. L., C. H. Gresham and S. Hall. 1950. The Flammulated Screech Owl (*Otus f. flammeolus*) in Louisiana. Auk 67:386.

Godfrey, W. E. 1966. The birds of Canada. Natl. Mus. of Canada Bull. 203. Biol. Series 73.

Grinnell, J. 1915. A distributional list of the birds of California. Pac. Coast Avif. 11:5-217.

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avif. 27.

Griscom, L. 1935. Critical notes on Central American birds in the British Museum. Ibis 77:549.

Hanna, W. C. 1941. Nesting of the Flammulated Screech Owl in California. Condor 43:290-291.

Huey, L. M. 1932. Two noteworthy records for California. Auk 49:107.

Jacot, E. C. 1931. Notes on the Spotted and Flammulated Screech Owls in Arizona. Condor 33:8-11.

Johnson, N. K. 1962. Distributional data on certain owls in the western Great Basin. Condor 64:513-514.

Johnson, N. K. 1963. The supposed migratory status of the Flammulated Owl. Wilson Bull. 75:174-178.

Johnson, N. K. 1965. The breeding avifaunas of the Sheep and Spring ranges in southern Nevada. Condor 67:93-124.

Johnson, N. K. 1970. The affinities of the boreal avifauna of the Warner Mountains, California. Occas. Pap. Biol. Soc. Nevada 22:1-11.

Kenyon, K. W. 1947. Cause of death of a Flammulated Owl. Condor 49:88.

Ligon, J. D. 1968. Starvation of spring migrants in the Chiricahua Mountains, Arizona. Condor 70:387-388.

Marshall, J. T. Jr. 1939. Territorial behavior of the Flammulated Screech Owl. Condor 41:71-78.
Marshall, J. T. Jr. 1955. Hibernation in captive goatsuckers. Condor 57:129-134.
Marshall, J. T. Jr. 1957. Birds of pine-oak woodland in southern Arizona and adjacent Mexico. Pac. Coast Avif. 32:1-125.
Marshall, J. T. Jr. 1967. Parallel variation in North and Middle American screech-owls. Western Found. Vert. Zool. Monogr. 1:1-72.
McCaskie, G. 1970. The Blackpoll Warbler in California. Calif. Birds 1:95-104.
McCaskie, G. 1971a. Rusty Blackbirds in California and western North America. Calif. Birds 2:55-68.
McCaskie, G. 1971b. The nesting season. Southern Pacific Coast region. Am. Birds 25:905-908.
Miller, A. H. 1947. The structural basis of the voice of the Flammulated Owl Auk 64:133-135.
Miller, A. H. 1951. An analysis of the distribution of the birds of California. Univ. California Publ. Zool. 50:531-644.
Miller, L. 1933. A pleistocene record of the Flammulated Screech Owl. Trans. San Diego Soc. Nat. Hist. 7:209-210.
Miller, L. 1936. The Flammulated Screech Owl on Mount Pinos. Condor 38: 228-229.
Miller, L. 1952. Auditory recognition of predators. Condor 54:89-92.
Olberholser, M. H. C. 1899. The Flammulated Screech Owls (*Megascops flammeolus*) (Kaup) and (*Megascops flammeolus idahoensis*) Merriam. Ornis 10: 23-38.
Palmer, E. D. 1894. Capture of another Flammulated Owl in California. Auk 11:78.
Pearson, O. P. 1960. Torpidity in birds. Bull. Mus. Comp. Zool. 124:93-103.
Phillips, A. R. 1942. Notes on the migrations of the Elf and Flammulated Screech owls. Wilson Bull. 54:132-137.
Phillips, A., J. Marshall and G. Monson. 1964. The birds of Arizona. Univ. Arizona Press, Tucson.
Ross, A. 1969. Ecological aspects of the food habits of insectivorous Screech Owls. Western Found. Vert. Zool. Monogr. 1:301-344.
Simpson, J. M. and J. R. Werner. 1958. Some recent bird records from the Salt River Valley, central Arizona. Condor 60:68-70.
Stephens, F. 1902. Owl notes from southern California. Condor 4:40.
Storer, T. I. and R. L. Usinger. 1963. Sierra Nevada natural history. Univ. California Press, Berkeley and Los Angeles.
Sumner, L. and J. S. Dixon. 1953. Birds and mammals of the Sierra Nevada. Univ. California Press, Berkeley and Los Angeles.
Sutton, G. M. and T. D. Burleigh. 1940. Birds of Las Vigas, Vera Cruz. Auk 57:234-243.
Thomas, J. H. 1961. Flora of the Santa Cruz Mountains of California. Stanford Univ. Press, Stanford.
Willett, G. 1912. Birds of the Pacific slope of southern California. Pac. Coast Avif. 7:5-122.
Winter, J. 1971. Some critical notes on finding and seeing the Flammulated Owl. Birding 3:204-209.
Woolfenden, G. E. 1970. A putative skeletal specimen of the Flammulated Owl with Alabama locality data. Wilson Bull. 82:223-224.

APPENDIX A. Specimen records of Flammulated Owl in California.

COUNTY	LOCATION	DATE	SEX, SPECIMEN NO.
El Dorado	Meeks Bay, Lake Tahoe	10 Sep 1937	F MVZ 72523
"	0.5 mi SE Al Tahoe	2 Jun 1941	F? CAS 57975
Fresno	Near Jackson Lake	8 Sep 1946	*see Kenyon (1947)
Inyo	Shepard Canyon Argus Mts.	11 Aug 1931	F juv. SDNHM 14919
"	9.5 mi W, 1.25 mi S. Lone Pine	24 May 1942	M MVZ 84822
Lake	NE slope of Mt. Hanna	8 Jul 1940	M MVZ 79271
Lassen	1 mi E Fredonyer Summit; 3 mi N, 8 mi E of Westwood	18 Jun 1959	M MVZ 140106
"	Coyote Flat	8 Jul 1961	M MVZ 142634
Los Angeles	4.5 mi E Chilao, San Gabriel Mts.	17 Jun 1947	M UCLA 34478
"	"	16 Jun 1947	M UCLA 34477
Modoc	10 mi W of Canby	9 Jun 1958	M MVZ 136796
"	"	10 Jun 1958	M MVZ 136795
Mono	9 mi W Benton	22 Jun 1942	M MVZ 84824
"	Twin Lakes SW of Bridgeport	early June 1942	? MVZ 53837
"	Near Parker Lake (on trail)	Aug 1958	**SBNHM catalog
Monterey	Top of Junipero Serra Pk.	20 Jul 1966	? PGNHM 2329
Placer	Big Oak Flat 10 mi NE of Foresthill	8 Aug 1967	F juv. CAS 67069
"	1 mi W Martis Pk.	30 Jun 1960	M MVZ 140530
Plumas	Quincy	1907	*see Bryant (1920)
San Bernardino	6 mi NW of Fawnskin, San Bernardino Mts.	11 Jun 1952	F SBCM 1814
"	Raywood Flat, San Gorgonio Pk.	3 Jun 1884	*see Gilman (1902)
"	Running Springs San Bernardino Mts.	5 Oct 1962	F SBCM 3410
"	NW side Clark Mt.	20 May 1939	F MVZ 77347
"	San Bernardino Mts.	26 May 1893	*see Palmer (1894)
"	"	18 Jan 1885	M MCZ 210149
"	Bluff Lake, San Bernardino Mts.	15 Jul 1905	M MVZ 32350
Shasta	Burney Springs, 1.75 mi S of Burney Mt. LO	24 Jul 1955	F CSUS 967
"	Fort Crook, near Cayton	23 Aug 1860	M USNM 24172
"	2 mi S of Shingletown	20 Sep 1972	captive pet

COUNTY	LOCATION	DATE	SEX, SPECIMEN NO.
Sierra	1.5 mi W Sardine Pk.	2 Jun 1959	F MVZ 140107
"	1.75 mi E, 0.5 mi S Babbitt Pk.	7 Jul 1962	M MVZ 148235
"	"	"	M MVZ 148233
"	"	"	M MVZ 148234
"	"	"	M MVZ 148232
"	"	"	M MVZ 148231
"	"	22 May 1963	F MVZ 149877
"	"	"	F MVZ 149876
Trinity	1 mi N, 0.5 mi W Norse Butte	31 Aug 1942	M MVZ 87454
"	4 mi N, 1 mi W Norse Butte	30 Aug 1942	M MVZ 87453
"	"	28 Aug 1942	F juv. MVZ 87452
"	"	"	F juv. MVZ 87451
"	Mad River	12 Jun 1930	M MVZ 56283
"	SE side of Hayfork Bally	9 Jun 1946	M MVZ 95530
"	"	"	M MVZ 95531
Tulare	Hospital Rock, Sequoia Natl. Park	8 Sep 1901	M LMC 1892 (UCLA)
"	Monache Meadows	4 Aug 1911	M MVZ 19808
"	"	"	M juv. MVZ 19809
"	Meadows Flat, W base of Redwood Mt.	12 Jun 1938	M MVZ 74633
"	"	"	M MVZ 74632
"	"	"	M MVZ 74634
"	Whitaker's Forest, 10 mi NE of Badger	3 Jun 1938	M MVZ 74630
"	"	7 Jun 1938	M MVZ 74631
"	"	21 May 1938	M MVZ 74629
"	Big Meadow, Sequoia Natl. Forest	10 Jul 1938	M MVZ 74635
"	"	"	M MVZ 74637
"	"	"	M MVZ 74636
"	14 mi E Calif. Hot Springs	24 Jun 1938	F LSU 39813
Ventura	Chula Vista Campground, Mt. Pinos	24 Jul 1936	F *see L. Miller (1936)
Yolo	Davis (U.C. Davis Campus)	31 Oct 1935	F UCD 922

CAS-California Academy of Sciences
CSUS-Calif. State Univ., Sacramento
LMC-Loye Miller Collection
LSU-Louisiana State Univ.
MCZ-Mus. of Comparative Zool., Harvard
MVZ-Mus. of Vertebrate Zool., Berkeley
PGNHM-Pacific Grove Nat. Hist. Mus.
SBCM-San Bernardino Co. Museum
SBNHM-Santa Barbara Nat. Hist. Mus.
SDNHM-San Diego Nat. Hist. Museum
UCD-Univ. of California at Davis
UCLA-Univ. of Calif. at Los Angeles
USNM-U. S. National Museum

*Unable to locate specimen
**Destroyed by fire

APPENDIX B. Sight records of Flammulated Owl in California.

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Butte	20 mi NE Chico	22 May-17 Jul 1972	14	T. Manolis, B. Webb
Calaveras	Big Trees	30 Jun 1882	1	L. Belding
"	"	16 Aug 1880	1	"
El Dorado	No. Fork of Silver Cr., S of Robbs Pk.	29 Jun 1947	1	J. T. Marshall Jr.
"	1.5 mi E Bijou, Lake Tahoe	4 Jun 1936	1	"
Humboldt	Top of Salmon Mt.	27 May 1973	1	T. Schulenberg
"	Alder Point	3 Jun 1973	1	"
Inyo	Lone Pine Creek	23 Jun 1934	2	D. McLean
Lassen	0.5 mi E Eagle Lake Biology Sta. T32N, R11E, SE ¼ Sec 22	8 Jun 1973	1	T. Manolis, R. Lederer
Los Angeles	NW side of Mt. Waterman, San Gabriel Mts.	16 Jun 1946	3	J. T. Marshall Jr.
"	Big Pines Playground	10-11 May 1934	Several	see L. Miller (1952)
"	Buckhorn Flats, 2 mi NE Mt. Waterman, San Gabriel Mts.	20 May 1973	Nesting pr. w/3 young	J. Norton
Mariposa	Peregoy Meadows, Yosemite Natl. Park	10 Jun 1961	1	W. J. Fitzpatrick
"	"	2 Aug. 1969	1	G. McCaskie
"	Between Chinquapin and Wawona, Yosemite Natl. Park	25 May 1969	1	G. Bolander
"	"	21 May 1966	1	"
"	Henness Ridge	11 Jun 1964	2	G. McCaskie
"	"	late May 1966	4	many observers
"	"	4 Jun 1962	1	G. McCaskie
"	"	22 May 1965	1	T. Chandik
"	"	25 May 1968	2	P. Devillers
"	"	30 Oct 1967	2-3	D. DeSante
"	Tenaya Lake to Mirror Lake Trail, Yosemite Natl. Park	20 Jul 1939	5	J. T. Marshall Jr.
"	Merced Grove, Big Trees Yosemite Natl. Park	7 Jul 1925	1 (nest)	D. McLean
Modoc	Thomas Creek, Warner Mts.	11-14 Jun 1964	2-3	N. K. Johnson, W. Russell
"	New Pine Creek, Warner Mts.	17 Jun 1964	Several	"

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Monterey	China Camp, Los Padres Natl. Forest	19 Apr 1972	1	R. Stallcup
"	"	28 Apr 1971	1	V. Yadon
"	"	30 Apr 1966	2-3	R. Branson, W. Reese
"	"	1 May 1971	2	R. Stallcup, R. LeValley
"	"	10 May 1969	3	T. Chandik
"	"	8-13 May 1967	Several	W. Reese, T. Chandik, A. Baldridge, D. DeSante
"	"	12 May 1966	3-4	R. Branson, A. Baldridge, W. Reese
"	"	13 May 1967	5	T. Chandik
"	"	20 May 1967	4	"
"	"	25 May 1968	1	"
"	"	2 Jun 1966	1	A. Baldridge, W. Reese
"	"	6 Jun 1971	1	T. Chandik
"	"	8 Jul 1968	2	"
"	Cone Pk., Los Padres Natl. Forest	18 May 1968	Several	R. Branson, V. Yadon
"	Chews Ridge, Los Padres Natl. Forest	15 Sep 1967	1	R. Branson, W. Reese
Placer	Big Oak Flat, 10 mi NE of Foresthill	12 Jun 1968	3	J. Winter
"	"	17 Jun 1968	1	"
"	"	18 Jun 1970	8	"
"	"	19 Jun 1969	1	"
"	"	30 Jun 1971	10	"
"	"	22 Jun 1968	2	"
"	"	6 Jul 1968	6	"
"	"	10 Jul 1970	3-4	"
"	"	6 Jul 1971	3	"
"	"	19 Jul 1970	3-4	"
"	"	24 Jul 1971	1	"
"	"	25 Jul 1970	3	"
"	"	26 Jul 1970	1	"
"	"	8 Aug 1970	4	"
"	"	9 Aug 1970	1	"
"	1 mi W Martis Pk.	30 Jun 1960	4	N. K. Johnson
"	Tahoe City	30 Jun 1963	1	G. McCaskie
Plumas	3.5 mi N, 1.5 mi W of Beckwourth	16 Jun 1971	1	N. K. Johnson
"	Crocker Meadow, 3.5 mi N, 3 mi W of Beckwourth	"	4	"
"	Poco Cabin, 6.5 mi E, 1 mi S of Mt. Ingalls	18 Jun 1971	1	"
"	Buck's Lk. & Haskins Mdw.	17 Jul 1938	3	J. T. Marshall Jr.
"	West slope of Thompson Pk.	15 Oct 1937	1	D. McLean

FLAMMULATED OWL

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Riverside	Tahquitz Valley, San Jacinto Mts.	13 Jul 1972	1	J. Fairchild
"	Little Round Valley, 1 mi SW San Jacinto Pk.	28 Apr 1969	1	"
San Bernardino	Dry Lake, N Base of Mt. San Gorgonio	29 Jun 1935	1	J. T. Marshall Jr.
"	"	21 Jun 1905	1	J. Dixon, J Grinnell
"	Hanna Flats, San Bernardino Mts.	15 Jun 1968	1	R. Mancke
"	Big Bear Lake near Fawnskin	30 Apr 1966	1	G. S. Suffel
"	San Bernardino Mts. (Hanna 1941)	1-7 Jun 1941	Nesting pair	W. Hanna, J. Fairchild
"	Base of Sugar Loaf Mt. near Big Bear Lake	19 Jul 1921	1	J. McB. Robertson
"	Near IS Ranch, Big Bear Lake	17 Jul 1921	1	"
San Diego	Mt. Palomar	29 Apr 1972	2	J. Winter, C. Lyons, S. Terrill
"	"	13 Jun 1971	2	A. Morley
"	"	16 Jun 1971	2	P. Devillers
"	Cuyamaca Rancho State Park	27 Apr 1972	1	S. Terrill
"	San Diego Harbor	10 Oct 1962	1	see Banks (1964)
Santa Cruz	Ben Lomond	4 Aug 1962	1	R. Stallcup
Shasta	5 mi SE Lakehead between Fall Creek and Coal Creek	18 Jun 1972	1	T. Manolis, B. Webb
Sierra	1.5 mi W Sardine Pk.	14 May 1959	3	N. K. Johnson
"	Dog Valley Campground, 11 mi NE Truckee, T19N, R17E, Sec 3	15 Jun 1974	1	G. Zamzow, B. Principe
Siskiyou	4 mi E McCloud	3 Jun 1930	3	D. McLean
"	6 mi S, 5.25 mi W of Macdoel	25 Jun 1967	1	N. K. Johnson
Trinity	20 mi W Weaverville	20 Jun 1931	1 (dead)	D. McLean No specimen
Tulare	S side Park Ridge on trail from Park Ridge LO	10 Aug 1935	1	J. T. Marshall Jr.
"	Foot of Solo Pk.	9 Jul 1963	1	M. Mires
Tuolumne	Carnegie Institute Station near Mather	19 May 1970	2	M. Perone
"	"	21 May 1970	2	"
Ventura	Mt. Pinos Campground, Mt. Pinos	June-July 1950	1	H. Clarke

Sketch by Tim Manolis

INTERIOR BIRD SPECIES EXPAND BREEDING RANGES INTO SOUTHERN CALIFORNIA

NED K. JOHNSON, Museum of Vertebrate Zoology and Department of Zoology, University of California, Berkeley, California 94720

KIMBALL L. GARRETT, Department of Zoology, University of California, Berkeley, California 94720 (present address: Department of Biology, University of California, Los Angeles, California 90024)

Distributional records of birds, scattered in space and time, reach their full potential when fitted together to form a previously unseen pattern. This fact underscores the value of accumulated details of distribution even though single records can be considered trivial when studied alone. Rarely, sufficient information on breeding occurrence of birds in one area is available for two different periods of time. When this happens, some comparisons of interest to general ecologists become possible. For example, the response of the avifauna to habitat change may be studied (Emlen 1974). Or, turnover (versus stability) of the breeding bird species in relation to time may be investigated, as has been attempted with varying degrees of success for certain island avifaunas (Lynch and Johnson 1974).

In California field zoologists painstakingly described and documented the distribution of each species of vertebrate during the first several decades of this century. These efforts resulted in remarkably dependable old records which now can be compared with data from more recent years. At many of the early survey sites the environments have been drastically altered and the avifaunas have changed; the original specimens and notes thus form an irreplaceable record of the past. Importantly, however, at some localities where essentially complete early avifaunal surveys were conducted, the habitats have not been modified appreciably in the ensuing years. Especially surprising is to note that despite this apparent stability of habitats the breeding avifaunas have changed in certain of these undisturbed areas, without any apparent explanation. The purpose of this paper is to summarize records of eight species of birds that in recent years have expanded or are presently attempting to expand their breeding distributions into historically unmodified habitats in southern California from centers of population abundance in the interior of the western or southwestern United States. The following accounts detail recent evidence of range expansion for these species.

Whip-poor-will (*Caprimulgus vociferus*).

The first evidence of probable breeding of the Whip-poor-will in California was reported by Jones (1971), who discovered two calling individuals near Lake Fulmor in the San Jacinto Mountains, Riverside County, on 2 May 1968. From spectrographic study of a tape-recorded song, Jones concluded that the race *C. v. arizonae* was involved. This record significantly extended the summer range of this subspecies westward from the Hualapai Mountains, Mohave County, Arizona (Phillips et al. 1964) and the Sheep Range, Clark County, Nevada (Johnson 1965). Convincing evidence that this colonization of the San Jacinto Mountains was successful is provided by the fact that the Whip-poor-will has been found annually during the breeding season at Lake Fulmor, from 1968 through 1974 (Jones 1971; McCaskie 1971, 1972, 1973a; Sadie Brown and J. Van Remsen pers. comm.) and at least three additional localities in the same range (McCaskie 1972, 1973b; Jones 1971). The discovery of a calling bird in the Laguna Mountains, San Diego County, on 8 July 1971 (McCaskie 1971), suggests that the breeding range also has expanded into other mountain ranges of southwestern California.

The species also occurs, and probably nests, in eastern San Bernardino County, for on the evening of 22 June 1974, Garrett and William Principe heard a Whip-poor-will calling on the north slope of Clark Mountain. On the following morning shortly before dawn two birds were calling in the same area. They occurred on a rugged and steep canyon slope near 6000 feet elevation at the lower edge of the White Fir (*Abies concolor*) and Singleleaf Pinyon (*Pinus monophylla*) association described by Miller (1940). Although the western subspecies prefers oak-conifer woodlands in its range in Arizona and Mexico, the steep and well-wooded terrain of this section of Clark Mountain seems at least marginally suitable. The occurrence of Whip-poor-wills on Clark Mountain provides another northwestern outpost in the breeding range. Although the time of the probable colonization of Clark Mountain is unknown, it is likely that this species has been overlooked in recent years because the limited field work conducted there since Miller's (1940) earlier visits has been restricted to the daylight hours.

Evidence of breeding of Whip-poor-wills should be sought at additional localities in dry oak-conifer associations of montane areas of San Diego, Riverside, and San Bernardino counties. Furthermore, a specimen is needed from California to substantiate the belief that *C. v. arizonae* is the breeding subspecies.

Broad-tailed Hummingbird (*Selasphorus platycercus*).

This Great Basin and Rocky Mountain species is known to breed west to the White, Inyo, Grapevine, and Clark Mountain areas in east-central

California (Grinnell and Miller 1944), where it is fairly common in the vicinity of canyon-bottom thickets in the pinyon-juniper association. Recent records to the southwest of the known breeding distribution in California suggest the possibility of colonization of other ranges. For example, McCaskie (1968a) reports an individual present some 25 miles southeast of Clark Mountain, in the New York Mountains, San Bernardino County, on 12 May 1968. Much farther west, a male was observed in the San Bernardino Mountains at Green Valley on 10 June 1971 (McCaskie 1971), and Garrett observed a male along Arrastre Creek, east of Baldwin Lake in the same range, on 13 May 1972. None of these individuals was known to have bred at these localities. However, the more inconspicuous nesting females might easily have been overlooked, and breeding is a strong possibility in view of the dates and habitat. The Arrastre Creek locality has open woodland of juniper (*Juniperus*) and Singleleaf Pinyon, with a willow-lined creek and numerous flowering shrubs, and thus affords habitats similar to those occupied by this species in the western Great Basin. Grinnell (1908) did not record this species from the San Bernardino Mountains. Although occurrence of the Broad-tailed Hummingbird in this range could be strictly casual, the species may be preparing to colonize and we wish to alert observers to this possibility.

Gray Flycatcher (*Empidonax wrightii*)

Johnson (1966:72) mapped breeding localities for this species in the western portion of its range in California and Nevada. Known records occurred southward on the east side of the Sierra Nevada to the Inyo and Grapevine mountains and included the high mountains of Clark County, Nevada. A major recent southwestward extension of breeding range in California, into formerly unoccupied woodland of mature Singleleaf Pinyon, is supported by new records from the eastern part of the southern Sierra Nevada of Tulare County (singing commonly, and breeding specimens taken by Johnson at 1.5 mi. N and 3 mi. W Chimney Peak, 7900 ft., 23 May 1973, and at 2.5 mi. S and 4.5 mi. W Chimney Peak, 6800 ft., 25 May 1973), and from Clark Mountain, eastern San Bernardino County (two singing males on north slope, at 6500 and 6700 ft., 26 May 1973; three singing males on north slope between 6400 and 7300 ft., 30 May 1974).

The first record to suggest expansion of breeding range into southwestern California was obtained by Shumway Suffel, who collected a male with enlarged (5 x 3 mm) testes on 10 June 1966, at Sheep Creek, 5000 feet, north of Wrightwood, San Gabriel Mountains, San Bernardino County. This specimen (Los Angeles County Museum No. 66118) has been examined and the identification verified. Importantly, it is a first-

year individual, the age category that is often involved in examples of vagrancy or pioneering. The Gray Flycatcher also has colonized the eastern portion of the San Bernardino Mountains in recent years. McCaskie (1968b) suspected breeding east of Baldwin Lake in 1968, for he reported the species throughout the period 1 June to 15 August. In 1969, Gray Flycatchers were breeding commonly east of Big Bear Lake (McCaskie 1969). Garrett observed a family group at Arrastre Creek on 27 July 1971. Finally, Johnson found six singing males on territories between 6700 and 6900 feet elevation in the vicinity of Arrastre Creek, from 27 to 28 May 1974, and took a male with enlarged testes.

Although it cannot be stated with total assurance that Gray Flycatchers were formerly absent in the Chimney Peak area, because of inadequate past field work there, colonization in recent decades of the Clark Mountain region and of the eastern portion of the San Bernardino Mountains is reasonably certain because both areas had been the sites of intensive vertebrate surveys which did not record this species (Johnson et al. 1948, Grinnell 1908). An earlier report by Grinnell (1908; under "*Empidonax griseus*") of the Gray Flycatcher from the San Bernardino Mountains was withdrawn (Grinnell and Miller, 1944:258-259; under "Wright Flycatcher" [=*Empidonax wrightii* at that time]) because the specimens and notes upon which the report was based were found to pertain to mis-identified Dusky Flycatchers (*Empidonax oberholseri*), the common form of *Empidonax* that breeds in the high mountains of southern California.

Solitary Vireo (*Vireo solitarius plumbeus*).

The very distinctive form *V. s. plumbeus* of the Solitary Vireo was not recorded in California during the breeding season until 1962, when DeBenedictis and McCaskie (1967) reported a summer specimen and sight records from two localities in the White Mountains, Inyo County. Since these initial records Johnson has collected specimens of *V. s. plumbeus* in breeding condition also in the White Mountains (Westgard Pass, 7200 ft., Inyo County, 7 June 1969; Queen Canyon, 6900 ft., southern Mineral County, Nevada, 11 June 1969), in Tulare County (3 mi. N and 2 mi. W Chimney Peak, 7600 ft., 23 May 1973; 1.75 mi. S and 0.5 mi. E Kennedy Peak, 6800 ft. 24 May 1973), in Death Valley National Monument (specimens from Grapevine Mountains taken in Nevada approximately 1 mi. E of California state line; see Johnson 1974), and in San Bernardino County (N face Clark Mountain: singing male taken at 6400 ft. on 28 May 1973 and two singing males [one with mate] seen at 6800 ft. on 30 May 1974; Arrastre Creek, 6800 ft., San Bernardino Mountains, 28 May 1974, pair at nest and laying female taken). Garrett found *V. s. plumbeus* at Arrastre Creek on 10 July 1971, on which date

an adult was feeding a recently-fledged juvenile. He also saw the species at the same place on 21 June 1972. All of the foregoing records were from areas grown to mature Singleleaf Pinyon.

These records indicate that the breeding range of *V. s. plumbeus* has undergone a major westward expansion, perhaps during the last decade. This form was not found in earlier years by several thorough field expeditions that visited the White Mountains (Miller and Russell 1956), the Grapevine Mountains (Miller 1946), Clark Mountain (Miller 1940, Johnson et al. 1948; *V. s. cassinii* is a spring migrant in this area), and the San Bernardino Mountains (Grinnell 1908; *V. s. cassinii* breeds in the southern and western portions of these mountains). That the breeding dsitribution of *V. s. plumbeus* has changed is supported also by similar data on recent range adjustments of the same form in southern Nevada (Johnson 1965, 1973, 1974).

Virginia's Warbler (*Vermivora virginiae*).

This interior species is known as a summer resident in California from the White Mountains in Inyo County and from Clark Mountain in eastern San Bernardino County (Grinnell and Miller 1944:396; Miller and Russell 1956). A surprising extension of known breeding range to a point approximately 110 miles southwest of Clark Mountain, the nearest known breeding locality, was recorded on 27 May 1974, when Johnson found three individuals on territories in the San Bernardino Mountains, San Bernardino County. Along Arrastre Creek, 6900 feet elevation, a pair of Virginia's Warblers responded to squeaks and imitated owl calls and approached to within 10 feet in an area covered with mixed mahogany (*Cercocarpus*), juniper, serviceberry (*Amelanchier*), Singleleaf Pinyon, and scattered Ponderosa Pine (*Pinus ponderosa*). One individual carried nesting material. One-quarter mile upstream, at 7000 feet, a singing male of this species was patrolling an area of vegetation similar to that just described for the pair. This bird sang from Ponderosa Pines and mahogany and was watched for approximately one-half hour. The following day another Virginia's Warbler was found along the South Fork of the Santa Ana River, at 6000 feet elevation and, importantly, in the coastal drainage of the San Bernardino Mountains. The bird responded well to hissing and imitated owl calls and came within five feet on a steep and rather arid slope approximately one hundred yards above the creek. The vegetation here was open mahogany scrub woodland with much mixture of juniper, small White Firs, small Ponderosa Pines, serviceberry, and a few Canyon Live Oaks (*Quercus chrysolepis*) and Incense Cedars (*Libocedrus decurrens*). The distinctive call note was heard for 15 minutes after the bird had retreated into the thick under-

story and a nearby nest was suspected. Habitat similar to that at both localities where these warblers were discovered occurs widely in the eastern San Bernardino Mountains and it is likely that a breeding population of Virginia's Warblers is scattered through this general region.

Miller (1940) estimated that the population on the north slope of Clark Mountain consisted of four pairs in 1939. The species still breeds there in small numbers. Johnson found three pairs on 26-28 May 1973, and at least two pairs on 30 May 1974. Garrett, with William Principe, recorded a pair and a single bird on the north slope of Clark Mountain on 23 June 1974.

Grace's Warbler (*Dendroica graciae*).

There are two previously published records of Grace's Warbler in California, both of fall vagrants or migrants, a specimen from near Imperial Beach, San Diego County, on 29 October 1966, and an individual (banded and photographed) from Point Loma, San Diego County, on 8 September 1968 (Craig 1970). The first indication of possible breeding occurrence in the state came on 30 May 1974, when Johnson found a steadily-singing male in the mixed forest of White Fir and pinyon at 7100 feet elevation on the north slope of Clark Mountain, San Bernardino County. The bird stayed within close range and was watched for over one hour as it sang and infrequently foraged in both firs and pinyons. Although this bird definitely was established on a clearly circumscribed area, actual nesting is questionable because neither Garrett and Principe nor McCaskie and party could find the species on later visits to the same site (22-23 June 1974, and 29-30 June 1974, respectively). Even though Grace's Warbler may not yet have colonized Clark Mountain, where the habitat for the species is marginal at best, the record of the singing bird is of interest because it suggests westward pioneering.

In view of the dramatic colonization of Grace's Warbler in the last decade into the yellow pine forests of southern Nevada, where it now is a summer resident in at least five mountain ranges (Johnson 1965, 1973, 1974), breeding occurrence at present in appropriate habitat in southern California seems very likely. The species should be sought in warm and arid stands of yellow pines, particularly on flats or gently-sloping ground. In the eastern portion of the San Bernardino Mountains, for example, there is much habitat that appears suitable.

Painted Redstart (*Setophaga picta*).

Records of the Painted Redstart in California have been summarized by Unitt (1974). Here we simply wish to note that this species

illustrates another example of a form from the interior of the southwest that seems to be presently colonizing or attempting to colonize southern California, as the following new observations help to document.

On 26 May 1973, Johnson found a singing individual of this species in the top of a White Fir at 7300 feet on the north slope of Clark Mountain, San Bernardino County. The bird did not seem to be patrolling a territory, for it left the area soon after being seen and was not noted subsequently. However, the mixed forest of White Fir and pinyon at this site, where shaded by huge cliffs at the bases of which water trickled from melting snow, seemed to offer at least some of the environmental requisites for breeding of this redstart. The species was not found on Clark Mountain in the breeding season of 1974, during the three known visits there by ornithologists.

On 28 May 1974, two Painted Redstarts, both singing, occupied adjacent territories along the north-facing slope above the South Fork of the Santa Ana River, 6100 feet elevation, San Bernardino Mountains, San Bernardino County. Here there was considerable shade from large Ponderosa Pines, White Firs, a few Sugar Pines (*Pinus lambertiana*), and some Incense Cedar. The birds chased soon after Johnson had encountered them in the same group of conifers. Then one remained where first found; the other patrolled for 100 to 200 yards upstream. Both continued to sing. One was watched for an hour during which time it sang and foraged from near the ground in Canyon Live Oak and Interior Live Oak (*Quercus wislizenii*) up into the mid-levels of mature pines and firs.

Hepatic Tanager (*Piranga flava hepatica*).

Phillips et al. (1964) include the Hualapai Mountains, Mohave County, in northwestern Arizona in the breeding range of this species. For Nevada, Johnson (1965) provides records of occurrence in the Sheep Range, Clark County and the Clover Mountains, Lincoln County, in June 1963.

The Hepatic Tanager was unrecorded in California by Grinnell and Miller (1944). Among the first records for the state was that of a male observed in the pinyon-juniper belt in Round Valley, east of Baldwin Lake in the San Bernardino Mountains, 21 May 1967 (McCaskie 1967). A male at the same locality on 30 May of the following year (McCaskie 1968a) indicated regular summer occurrence of this species in the San Bernardino Mountains. Garrett and J. Menke discovered a pair of Hepatic Tanagers along Arrastre Creek, at approximately 6700 feet elevation, at the ecotone of pinyon-juniper and yellow pine, on 10 July 1971, at a site less than 5 miles from Round Valley. The pair was observed until at least 27 July 1971, but no evidence of nesting was ob-

tained until 1972, when at least two pairs returned to the Arrastre Creek area by 11 May (McCaskie 1972). On 18 June 1972, J. Dunn and Garrett located an active nest of this species in a yellow pine 20 m from Arrastre Creek. During the following week the nest was observed by several individuals, including Shumway Suffel and Shirley Wells. The nest was placed approximately 20 m from the ground and 2.5 m from the main trunk. Both adults fed 3 or 4 young on 21 June, and a fledged bird was being fed by the adults on 8 July (Suffel pers. comm.). The tanagers returned to Arrastre Creek and nested with apparent success in 1973 (McCaskie 1973b), but were not observed there in 1974.

Arrastre Creek, San Bernardino Mountains, San Bernardino County, California, showing permanent willow-lined stream, scattered mature yellow pines, and an extensive mature pinyon-juniper association on the surrounding hillsides. Hepatic Tanagers nested in the tall yellow pine on the right in 1972, and Gray Flycatchers and Plumbeous Solitary Vireos have nested nearby.

Photo courtesy of G. Shumway Suffel

In addition to the San Bernardino Mountains, the Hepatic Tanager has colonized Clark Mountain, San Bernardino County, in recent years. It was not found here during the extensive field work of 1939 and 1940 (Miller 1940, Johnson et al. 1948), but was present in the pinyon belt and mixed pinyon-fir zone between 6100 and 6700 feet on the north slope in 1973, when Johnson observed two pairs and collected a singing male (testis 10 x 6 mm) on 28 May. On 23 June 1974, Garrett and William Principe observed a pair, in the pinyon-fir zone, which was extremely responsive to a taped recording of an Hepatic Tanager song.

In its Arizona range, this species is common in dense oaks and fairly common in pines and large pinyons (Phillips et al. 1964). Although the few available records indicate a preference for open pinyon-dominated woodland in California, the Hepatic Tanager should be looked for in pine and deciduous oak woodlands on warm and arid slopes of all mountains in southern California.

DISCUSSION

As the pages of *California Birds* and of Small (1974) indicate, a number of species in California have adjusted their breeding distributions in recent years. Just what proportion of the new records represent genuine range changes and what proportion are "new" localities for species always present in poorly-studied areas, but previously overlooked, is not easily determined. Even when the comparison of old and recent data clearly demonstrates a real extension of breeding range, habitat change, through lumbering, agriculture, grazing, planting of ornamental vegetation, and construction of water impoundments, has surely been a major influence.

In contrast, the species discussed in the foregoing accounts do not seem to have colonized California in response to any of the aforementioned kinds of habitat change. None are birds usually associated closely with man, his plantings, or domestic animals. Furthermore, the localities of many of the new records, namely Clark Mountain and the eastern section of the San Bernardino Mountains, both in San Bernardino County, have not been seriously disrupted by fire or human activity in recent years. The pinyon zone in both places is excellent and consists mostly of old-growth trees. The fir stand on Clark Mountain also is original growth.

One can reasonably ask if most or all of these species were present but overlooked during the early surveys of Clark Mountain (Miller 1940, Johnson et al. 1948) and of the San Bernardino Mountains (Grinnell 1908). For Clark Mountain this possibility is very remote; the extensive and thorough study of the breeding avifauna of this area by numerous

expert naturalists, in the late spring and early summer of 1938, 1939, and 1940, leaves little room for doubt on this point. Also the fir zone on Clark Mountain, from where most of the new records from that area were obtained, is small enough to be surveyed easily for birds in a single day. For the San Bernardino Mountains we can be less certain because of the enormity of the range and the consequent possibility that some of the species discussed here actually were present but perhaps occurred at low density and were thus overlooked. But it is known that Grinnell (1908) spent long periods of time at several of the localities where the new records were obtained and that his talents as a thorough field ornithologist are legendary.

That we are dealing with a group of examples of natural breeding range expansion is suggested by two additional points (1) at least six of the species discussed here also have spread northward or northwestward, presumably since the early 1960s, to breed in previously unoccupied mountain ranges of southern Nevada (Johnson 1965, 1974); (2) all of the species are derived from the interior of the western United States, in the Great Basin-Rocky Mountains region, or from the southwestern United States and northwestern Mexico. Thus, the species have similar biogeographic affinities, and to propose that they are responding as a group to some common environmental stimulus, or complex of stimuli, seems reasonable. It is appropriate to note here the report of Brown (1973) of recent western range extensions in Arizona of three other species of the southwestern interior, the Scaled Quail (*Callipepla squamata*), Montezuma Quail (*Cyrtonyx montezumae*), and Coppery-tailed Trogon (*Trogon elegans*), although especially for the quail the possible influence of habitat change through grazing and/or fire in permitting the distributional change cannot easily be excluded.

Because the eight species are present at the western periphery of their respective breeding distributions in southern California only during the spring and summer months, we suspect that some environmental change operative during that portion of the year is the most likely explanation. At present the exact nature of the suspected environmental change has not been identified but we speculate that it probably will be found to relate to some complex pattern of change in recent decades of spring and summer average moisture and temperature regimes and associated food resources.

Finally, we wish to emphasize that studies such as this, that attempt to synthesize distributional patterns from scattered information, are possible only because of the continued and combined efforts of many ornithologists to gather and preserve carefully-documented field records. With this in mind we encourage others to search for additional information bearing on breeding range extensions of montane species in southern California. Added data on breeding status and occurrence is needed for

many of the species we discuss. Furthermore, readers should be alerted to the probability that other interior species are currently colonizing the mountains of this area and that concentrated field work there is likely to be rewarding.

SUMMARY

In recent decades eight species of birds, derived from avifaunas of the Great Basin or the southwestern United States, have extended their breeding distributions into montane habitats of southern California. Because the range adjustments of these species seem unrelated to historical trends of habitat change or to other obvious man-caused environmental influences, we suspect that a subtle climatic shift affecting spring and summer temperature and moisture patterns and the availability of resources could be responsible.

ACKNOWLEDGMENTS

We wish to acknowledge the assistance of several individuals who courteously responded to our requests for information or helped in various ways. R. Guy McCaskie read the manuscript, offered suggestions, and provided several sources of additional data. William Principe accompanied Garrett to Clark Mountain, where several worthwhile records were obtained. Sadie Brown and Van Remsen verified the occurrence of the Whip-poor-will in the San Jacinto Mountains, California in June 1974. Dr. Kenneth Stager of the Los Angeles County Museum kindly sent a specimen for examination.

LITERATURE CITED

Brown, D. E. 1973. Western range extensions of Scaled Quail, Montezuma Quail and Coppery-tailed Trogon in Arizona. West. Birds 4:59-60.

Craig, A. M. 1970. Two California records of Grace's Warbler. Calif. Birds 1:77-78.

DeBenedictis, P. and R. G. McCaskie. 1967. Cassin's Kingbird and Plumbeous Solitary Vireo in the White Mountains of California. Condor 69:424-425.

Emlen, J. T. 1974. An urban bird community in Tucson, Arizona: derivation, structure, regulation. Condor 76:184-197.

Grinnell, J. 1908. The biota of the San Bernardino Mountains. Univ. Calif. Publ. Zool. 5:1-170.

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avif. 27:1-608.

Johnson, D. H., M. D. Bryant, and A. H. Miller. 1948. Vertebrate animals of the Providence Mountains area of California. Univ. Calif. Publ. Zool. 48:221-376.

Johnson, N. K. 1965. The breeding avifaunas of the Sheep and Spring ranges in southern Nevada. Condor 67:93-124.

Johnson, N. K. 1966. Bill size and the question of competition in allopatric and sympatric populations of Dusky and Gray flycatchers. Syst. Zool. 15:70-87.

Johnson, N. K. 1973. The distribution of Boreal avifaunas in southeastern Nevada. Occ. Pap. Biol. Soc. Nev. 36:1-14.

Johnson, N. K. 1974. Montane avifaunas of southern Nevada: historical change in species composition. Condor 76:334-337.

Jones, L. 1971. The Whip-poor-will in California. Calif. Birds 2:33-36.

Lynch, J. F. and N. K. Johnson. 1974. Turnover and equilibria in insular avifaunas, with special reference to the California Channel Islands. Condor 76: 370-384.

McCaskie, G. 1967. Spring migration. Southern Pacific Coast region. Aud. Field Notes 21:542.

McCaskie, G. 1968a. Spring migration. Southern Pacific Coast region. Aud. Field Notes 22:574-578.

McCaskie, G. 1968b. Nesting season. Southern Pacific Coast region. Aud. Field Notes 22:646-650.

McCaskie, G. 1969. The nesting season. Southern Pacific Coast region. Aud. Field Notes 23:693-696.

McCaskie, G. 1971. The nesting season. Southern Pacific Coast region. Am. Birds 25:905-908.

McCaskie, G. 1972. The spring migration. Southern Pacific Coast region. Am. Birds 26:807-814.

McCaskie, G. 1973a. The spring migration. Southern Pacific Coast region. Am. Birds 27:818-822.

McCaskie, G. 1973b. The nesting season. Southern Pacific Coast region. Am. Birds 27:917-920.

Miller, A. H. 1940. A Transition island in the Mohave Desert. Condor 42:161-163.

Miller, A. H. 1946. Vertebrate inhabitants of the piñon association in the Death Valley region. Ecology 27:54-60.

Miller, A. H. and W. C. Russell. 1956. Distributional data on the birds of the White Mountains of California and Nevada. Condor 58:75-77.

Phillips, A., J. Marshall, and G. Monson. 1964. The birds of Arizona. Univ. of Arizona Press, Tucson.

Small, A. 1974. The birds of California. Winchester Press, New York.

Unitt, P. 1974. Painted Redstarts attempt to breed in California. West. Birds 5: in press.

NOTES

A RECORD OF THE BAY-BREASTED WARBLER FROM UTAH

WILLIAM H. BEHLE, Department of Biology, University of Utah, Salt Lake City, Utah 84112

MICHAEL L. PERRY, Natural History State Museum, Vernal, Utah 84078

A new species to be added to the list of birds known to occur in Utah is the Bay-breasted Warbler *(Dendroica castanea).* Two warblers were seen by the authors very late in the afternoon of 25 May 1974 foraging in a mixed growth of cottonwoods and squawbrush along the floodplains of the White River at an elevation of 5200 feet about five miles east of Bonanza, Uintah County, northeastern Utah. Realizing that they were different, but not knowing for certain what kind of warbler was represented, the junior author collected one. It proved to be a fat male with testes measuring 6 x 4 mm. It is now number 22249, University of Utah collection. The identity of the second warbler could not be ascertained.

This species breeds in northern coniferous forests from the northeastern edge of the United States westward across Canada to southeastern British Columbia. It winters from the Canal Zone south to northern South America. The main corridor of migration is in the eastern United States. The species is considered to be a casual migrant in the Plains region. The occurrence of the species in Utah, still further west, might be expected if birds from British Columbia travel directly south and north to and from their wintering grounds, but the species may be truly of accidental occurrence in the state. It has been reported once in Arizona (Speich and Parker, Western Birds 4:53-57, 1973), once in New Mexico (Hubbard, Checklist of the birds of New Mexico, New Mexico Ornithol. Soc. Publ. No. 3, 1970), and numerous times in California (Small, The birds of California, Winchester Press, N. Y., 1974).

A BLUE-WINGED X GOLDEN-WINGED WARBLER IN CALIFORNIA

TOM SCHULENBERG, Humboldt State University, Arcata, California 95521
STEVE SUMMERS, 414 Pacific Avenue, Solana Beach, California 92075

On 1 October 1973 we discovered a Blue-winged x Golden-winged Warbler (*Vermivora pinus* x *V. chrysoptera*) in a willow (*Salix* sp.) patch at the old Eureka Airport, 0.25 mile south of Fairhaven, Humboldt Co., California. We studied the bird from 09:15 to 09:30 and then left for Arcata to contact other local birders. At approximately 10:30 we returned to the willow patch with Bob Behrstock, Dick Erickson, Gary Friedrichsen, Stan Harris, Ron LeValley, Linda Schliesman, Don Schmoldt and Paul Springer. The bird was easily relocated and seen well by everyone present. The bird was last seen at 14:45 by Summers, Bud Fry, and Stan and Tonna Harris. The following description was obtained:

> Crown very bright yellow. Nape, back and upper tail coverts olive-green. Black eyeline extending from base of bill through eye and almost as far past the eye as before the eye. Auricular area light greenish-gray.
>
> Wings gray with two very distinct intense yellow (almost gold) wingbars. Area immediately in front of bend of wing gray.
>
> Throat bright yellow fading to a heavy yellow wash on the upper breast and then becoming bright yellow again on the lower breast and belly up to and between the legs. Lower belly from legs back to and including under-tail coverts white except for a yellow wash in vent area. Sides white. Underside of tail had two elongated white spots.
>
> Eye and bill black. Legs medium in color—not black and not light.

A description and color drawing of the bird are on file with the California Field Ornithologists Records Committee.

During the entire period of observation the bird was actively feeding in the tops of the willows at a height of 15-20 feet. The bird was generally silent except for two occasions when a thin high-pitched "seep" was heard.

There are four acceptable records for the Blue-winged Warbler and nine for the Golden-winged Warbler in California (McCaskie pers. comm.) but no previous record for hybrids. Elsewhere in the west, Bailey and Niedrach (Birds of Colorado: 671, 1965) reported sightings of this hybrid in Colorado on 22 May 1955 and 14 May 1963. However, the Colorado Field Ornithologists Official Records Committee (Colorado Field Ornithologist 18:14, 1973) removed the hybrid from the *Official State List of the Birds of Colorado* due to the lack of documentation. Another hybrid was reported seen in New Mexico on 12 October 1960 (Audubon Field Notes 15:55, 1961) and later published by Sutton (Oklahoma birds: 492, 1967). However, Hubbard (Check-list of the birds of New Mexico: 74, 1970) stated the record was withdrawn.

Lester Short (pers. comm. to Ron LeValley) says our bird is unusual in having a yellow throat and distinct yellow wingbars. Hybrids of this type usually have white throats and fused yellow wingbars.

We wish to express our appreciation to Guy McCaskie and Dick Erickson for assistance in compiling western records of these birds.

FIRST LEAST TERN IN MONTANA

P. D. SKAAR, Biology Department, Montana State University, Bozeman, Montana 59715

About noon on 20 July 1974 I saw an immature Least Tern *(Sterna albifrons)* at the northeastern corner of the Cottonwood Reservoir along U. S. Highway 89 about four miles north of Wilsall, Park County, Montana. I observed the bird in bright sunlight through a 20X scope for about 20 minutes, often as close as 50 feet. The length and wing-span were no more than twice those of two brown-backed swallows (probably Rough-winged Swallows, *Stelgidopteryx ruficollis*) that twice harassed the tern closely. Both coloration and behavior differentiated it from an immature Black Tern *(Chlidonias niger)*. The bill was black, and the head was white except for a dark eye-stripe connected to a dark nape. The tail was short, shallowly indented and white except for a dusky terminal band. The back was grayish; the underparts were white. Most importantly, the upper wing surface was strikingly patterned. The outer primaries were blackish, a triangle extending from the body to the wrist was grayish, and a triangle extending from most of the trailing edge of the wing to the wrist was white. The bird hovered repeatedly and made several long vertical dives into the water. On one dive it took a small fish or tadpole. No call was heard. I am familiar with Least Terns from many observations on Long Island, New York. Three other observers were alerted but found no identifiable tern at the site later in the afternoon. This is the first record for the state, since the Montana specimen mentioned by Saunders (Pacific Coast Avifauna No. 14, 1921) was actually taken in Nebraska (Skaar, Clapp and Banks, Condor 75:132-133, 1973). The nearest breeding area known is along the Missouri River in central North Dakota.

Here's the definitive book on the diverse and beautiful bird life of the Golden State

THE BIRDS OF CALIFORNIA

by Arnold Small, President, Los Angeles Audubon Society

Here's the most complete, authoratative, up-to-date book available on the natural habitats of California and the birds that inhabit them. BIRDS OF CALIFORNIA is the culmination of 25 years of research and observation by Arnold Small, college professor, noted ornithologist and President of the Los Angeles Audubon Society.

The lucid, well organized text features a comprehensive, annotated list of the more than 500 birds that have appeared in California since 1900, with distribution, seasonal status and habitat preference noted for every bird. In addition, each of the 25 major habitats is described as to range, climate, topography, and bird life. Also included is an introduction to bird study on the subprofessional level, with valuable advice on equipment, techniques, and places to go during different seasons of the year.

Accompanied by maps and over 300 photographs illustrating 280 species, BIRDS OF CALIFORNIA is a volume that belongs in the bookcase of every bird lover. **$12.50**

MORE THAN 300 MAGNIFICENT PHOTOGRAPHS ILLUSTRATING 280 CALIFORNIA BIRDS IN THEIR 25 NATURAL HABITATS

Available at Pickwick, B Dalton and other fine bookstores or by mail from the Publisher

A-128

WINCHESTER PRESS
460 Park Ave., New York, N.Y. 10022
Please send me:

_____ copies **BIRDS OF CALIFORNIA** **@$12.50**

I enclose check or money order for $_____. If not satisfied I may return the books within 10 days for a full refund.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

(New York State residents add sales tax.)
Please add 35¢ for postage and handling.